



Additional chart coverage may be found in CATP2, Catalog of Nautical Charts.

SECTOR 6 — CHART INFORMATION

SECTOR 6

AUSTRALIA—CORAL SEA—ISLANDS AND DANGERS

Plan.—This sector describes the islands and dangers in the Coral Sea. The arrangement is from S to N and from W to E.

General Remarks

6.1 The Coral Sea lies between the E coast of Australia, on the W, and New Caledonia and the New Hebrides, on the E. The S limit is the parallel of 30°S; the N boundary is approximately the S extremity of the Solomon Islands and the S coast of the E part of New Guinea. Numerous islands, reefs, and sunken dangers, many of which have not been closely examined, are found in the Coral Sea. In general, the many islands in this area are not inhabited, but some of the islands and reefs are visited by local fishermen. There are some anchorages off the leeward sides of some of the reefs.

The charts of the Coral Sea should be referred to by vessels using the Outer Route from the parallel of Sandy Cape, N to Torres Strait. Vessels proceeding N should cross the above parallel at about the meridian of 157°E.

All vessels are cautioned to exercise extreme care in navigating in the vicinity of the reefs and other dangers in the Coral Sea. The usual set of the current is to the W, but it may be deflected or accelerated in the immediate vicinity of the reefs and dangers. Some areas of the Coral Sea have only been partially examined.

Winds—Weather.—The Southeast Trades are the prevailing winds between the parallels of 20°S and 25°S west of the meridian of 155°E, however, winds from the N and NW are common from September to December, and winds from the SW are common from May to August. Gales occur monthly from January to August W of the meridian of 155°E; and on an average of 3 or 4 days per month E of the meridian of 160°E. This frequency is somewhat less from September to December.

Between the parallels of 15°S and 20°S, the Southeast Trades are steady, and are fresh to strong. West of the meridian of 150°E, the Northwest Monsoon may occur in January. Gales are infrequent during the greater part of the year, but from June to August a SE gale occurs on an average of about 1 day a month, W of the meridian of 150°E, and on an average of 2 or 3 days per month farther E. Nearly all of these gales occur while a well-developed anticyclone is crossing the N part of Australia.

The Southeast Trades are very persistent N of the parallel of 15°S during the months of March to November and are often fresh and strong. In December, they have a tendency to weaken and are sometimes replaced by light NNW or W wind. In January and February, N and NW winds are about as frequent as the Southeast Trades. As a general rule and apart from brief squalls, gales do not occur on an average of more than one day a year N of the parallel of 15°S. Those which do occur are generally associated with tropical storms.

Tides—Currents.—Little is known of the currents in the Coral Sea except that they are variable and have a tendency to set in a NW or W direction towards Torres Strait. In the

vicinity of certain reefs in the Coral Sea, currents are sometimes deflected and their rate is often increased. These currents are referred to later under detailed descriptions of the reefs.

Along the Outer Route, little or no current is generally experienced until within 50 or 60 miles of the Great Barrier Reef in the direction of Torres Strait. In this area, a NW set becomes evident and increases in strength as the edge of the reefs is approached. The current tends to set N within 10 miles of the outer edge of the reefs, and its rate depends to a great extent on the strength and direction of the wind.

Pilot Charts for the South Pacific Ocean should be consulted for the average current conditions of the Coral Sea area.

South Part of Coral Sea—South of Marion Reef

6.2 Cato Island (23°15'S., 155°32'E.) is a small oval-shaped island and lies about 152 miles NE of Sandy Cape. The island is 5.8m high and formed of coral grit. An automatic weather station, with two radio masts and a silver-painted hut, stand on the NE end of the island. The island is almost entirely surrounded by reefs. There are three narrow boat passages through the reefs on the N side of the island. The best entrance is the center entrance, located 0.2 mile N of the E end of Cato Island, and has a conspicuous rock at half tide on its E side; leading marks, in line bearing 154.5°, lead into the entrance channel which is well defined. In 1989, this entrance was reported to lie almost 0.2 mile W of its charted position. The island lies on the W end of an oval-shaped reef enclosing a lagoon. The lagoon contains numerous coral heads. The sea breaks over the reef in all types of weather. The reef lies on Cato Bank and is steep-to on all sides. It has been reported the NW side of Cato Bank extends farther W than charted.

Hutchison Rock (23°15'S., 155°36'E.), with a depth of 5.5m, lies 2.5 miles E of Cato Reef. Danger Patch, coral rocks, with depths of less than 18.3m, lie near the outer end of the E ledge of Cato Bank. A tidal race is found between the E end of Cato Reef and Danger Patch. Tidal currents attain a rate of 1 to 3.5 knots during SE winds.

Anchorage.—The only suitable anchorage lies off the N side of Cato Reef, in a depth of 29m, coral grit, with the E end of Cato Island bearing 189°, distant 0.6 mile.

6.3 Wreck Reefs (22°11'S., 155°20'E.) lies with their W extremity about 66 miles NNW of Cato Island and consists of a narrow chain of reefs and several cays which cover an area of about 18 miles, W to E. The sea always breaks over the cays. Bird Islet, the E cay, is the only one known to produce vegetation. The wrecks contained within this area lie within a historic wreck site and are protected from unauthorized interference.

The passage between **Bird Islet** (22°10'S., 155°28'E.) and a reef 2.5 miles WSW has depths of 18 to 33m. This reef was reported to lie 0.5 mile SW of the charted position; a small

reef, 1 mile in diameter, lies 0.5 mile W. A reef is reported to extend 0.8 mile NW of Bird Islet.

Anchorage.—Anchorage may be obtained off the N side of the reefs, in depths of 18 to 37m, but the bottom is very uneven. Without local knowledge the area should be avoided. Anchorage may also be obtained, in depths of 26 to 31m, about 1 mile WNW of Bird Islet.

6.4 Porpoise Cay, about 27m high, lies 6.2 miles W of Bird Islet in the center of a shallow lagoon surrounded by a reef. The reef partially uncovers at LW.

West Islet (22°12'S., 155°10'E.), 1.8m high and bare, lies near the middle of the SE of three detached reefs at the W end of Wreck Reefs. A below-water reef lies 0.5 mile SE of the reef surrounding West Islet, with depths of 7.3 to 11m between them.

Landing can be made on the NW end of West Islet. It should be approached from the NW, following the shortest route across the reef taking care to avoid the coral heads.

Tides—Currents.—In the vicinity of Wreck Reefs, the tidal current sets SW during the rising tide and NE during the falling tide at a rate of about 1 knot. The tides rise about 1.8m in the area of Wreck Reefs.

Caution.—A bank, with depths of 25.5m, was reported to lie 68 miles E of Bird Islet; a depth of 16.5m was reported to lie 76 miles ENE of the same islet. Reported depths of less than 200m indicate the presence of a ridge extending NNE from the 25.5m patch toward Selfridge Bank. A depth of 18.3m was reported 59 miles ENE of Bird Islet.

Kenn Reefs

6.5 Kenn Reefs (21°16'S., 155°48'E.) consists of four separate reefs, and lies with Southwestern Extreme, the W end of the SW reef, 56 miles NNE of Bird Islet. The W side of the reefs forms a bay with depths of 9.1 to 68m, coral, sand, and rock, outside which the depths increase suddenly to more than 183m. All the reefs dry at half-tide, and the sea breaks over all of them except for the SW reef.

The Southwestern Extreme (21°17'S., 155°43'E.) has a conspicuous boulder, 1.8m high, on its NE side, which from a distance appears as part of a wreck. Landing can be made on the SW side of the reef. An exposed wreck lies on the S side of the reef. The reef is steep-to except on its N side, where it is fringed by below-water rocks. The SW reef is separated from the largest reef by an opening, 1.7 miles wide, which is unsafe for other than small vessels, owing to foul ground with depths of 7.3 to 9.1m in the middle of the fairway.

Eastern Projection (21°15'S., 155°50'E.) lies at the elbow of the SE and largest reef, and on it lies High Reef Stone, a large boulder. There are two sand cays on the SW part of the reef.

Anchorage.—Anchorage may be obtained, in a depth of 24m, 1.2 miles WNW of Observatory Cay, but care must be taken to avoid the below-water rocks in the vicinity.

The N reef encloses a shallow lagoon, which is entered on its W side near the S end. High Reef Stone and some other boulders lie close inside Northwestern Extreme, the N end of Kenn Reef. There is a channel, 2.5 miles wide between the N reef and the reef S of it, with depths of 18 to 60m.

Anchorage may be obtained, in depths of 37 to 44m, coral and sand, 0.5 mile SSW of Northwestern Extreme.

Saumarez Reefs

6.6 Saumarez Reefs (21°48'S., 153°42'E.) consists of three main reefs and numerous smaller reefs.

Northeast Cay (21°38'S., 153°46'E.), a small sand cay lying near the N extremity of Saumarez Reefs, is located about 86 miles NNW of West Islet of the Wreck Reefs. This 2.4m high cay, which is enclosed by a coral reef, with an opening on the SW side, is the northernmost of the Saumarez Reefs. A light, from which a racon transmits, is shown from the N edge of the cay. A clear channel, about 1.2 miles wide, lies between Northeast Cay and the next reef to the S.

Southeast Elbow (21°55'S., 153°35'E.), located about 20 miles SSW of Northeast Cay, forms the SE extremity of Saumarez Reefs. A conspicuous stranded wreck lies about 5.2 miles NE of Southeast Elbow. The wreck was reported to be a good radar target up to 19 miles. Three reefs lie between 0.5 to 4.2 miles WNW of Southeast Elbow. These small reefs are separated from each other by unsurveyed channels with widths of 0.5 to 1.2 miles.

Southwest Cay (21°50'S., 153°30'E.), enclosed by a reef, 6 miles NW of Southeast Elbow, is the westernmost above-water part of the Saumarez Reefs, and is 2.4m high. There is a channel, 2.2 mile wide, with depths of 27 to 46m, between the cay and the reef SSE.

Anchorage.—Recommended anchorages are 1.7 miles NW of Southeast Elbow, in a depth of 40m, and 2 miles E, 0.7 mile N, and 0.7 mile W, respectively, of Southwest Cay, in depths of 37 to 49m. Anchorage can also be taken about 0.7 mile N of Northeast Cay, in depths of 31 to 59m.

Fredrick Reefs

6.7 Observatory Cay (21°02'S., 154°23'E.), located about 50 miles NE of the NE extremity of Saumarez Reefs and 75 miles W of the NW extremity of Kenn Reefs, lies near the S end of **Frederick Reefs** (20°58'S., 154°24'E.). The reefs enclose a U-shaped body of water, known as Anchorage Sound, which is protected on all sides except the N.

Observatory Cay is 1.8m high; landing is possible on its N side through a boat channel which leads from NE through the reef. As the cay lies near the S edge of the reef, the surf sometimes breaks over it in heavy gales. In 1983, it was reported that Observatory Cay lay about 0.5 mile W of the charted position.

In 1990, it was reported that Observatory Cay is the only one of five cays on the S reef which does not cover.

A solitary remarkable leaning rock, 1.2m high, lies on the W extremity of the S reef, 1.5 miles WNW of Observatory Cay.

From Observatory Cay the S reef extends NE and N for 3.5 miles. Off the SE side of this reef the bottom was reported to have been seen at a distance of 1 mile from the reef, but no soundings were obtained. The inner edge of the reef, which is always covered, has some below-water patches lying 0.5 mile off it.

Danger Ridge (21°00'S., 154°21'E.), which is narrow, lies between the rock on the W end of the S reef and Ridge Rock, on which the sea always breaks. There are general depths of

9.1 to 12.8m over the ridge, but below-water dangers lie on the S end of the ridge, and near its middle. This passage should not be attempted.

North Reef Extreme, the N reef, is located with its S extremity about 1.7 miles N of the NE extremity of the S reef. It is about 1.5 miles long and about 0.5 mile wide. A small cay, from which Frederick Reef Light is shown and a racon transmits, is situated on this reef about 0.5 mile N of its S extremity. Landing can be effected on the W side of the reef.

There is clear passage between the N and S reefs, with general depths of 11 to 16.5m. Tide rips occur across the passage.

Anchorage.—Anchorage can be taken in Anchorage Sound, in depths of 18.3 to 31m, coral and sand. This anchorage is sheltered to the E and S, and partially protected to the W by Danger Ridge.

Marion Reef

6.8 Marion Reef (19°05'S., 152°17'E.), located about 150 miles NW of Frederick Reefs, is somewhat circular in shape. The N, E, and S margins are marked by narrow coral reefs, on the outer edges of which the sea always breaks. The W side has three small isolated reefs. Long Reef forms the SE side and Wansfell Reef the SW side of the group comprising Marion Reef.

Carola Cay (19°06'S., 152°23'E.), 3.7m high, is located 2.5 miles S of the end of Long Reef, the SE reef of the group. From this cay the reefs curve to the N and W for about 15 miles and to the S, SW, and W for about 18 miles. Two partly examined openings lie in the NE part and one near the SW end of Marion Reef. A white tower, conspicuous on radar, stands on Carola Cay.

A shoal, with a depth of 3.7m, lies about 2.5 miles NW of the N end of Carola Cay.

Paget Cay (19°15'S., 152°21'E.), 1.5m high, lies on the S side of Long Reef in a position 7.5 miles SSW of Carola Cay. A reef, which is reported to be extending S, lies about 1 mile SW of Paget Cay. A wreck was reported to be 2 miles to the S of its charted position on the reef.

Brodie Cay, 3m high, lies on the SE end of Wansfell Reefs, which form the SW side of Marion Reef. The sea breaks over the N reef. The opening between Wansfell Reefs is foul and overfalls occur on the S side. Brodie Cay was reported to lie 1.5 to 2 miles SW of its charted position. There are depths of 20 to 30m in the entrance between Brodie Cay and the W end of Long Reef. Anchorage can be found, in 8m, 0.2 mile E of Brodie Cay.

Two reefs, over which the sea breaks, lie on the W side of the bank, 10 miles N and 14 miles NNW, respectively, of Brodie Cay.

A S set of about 2 knots on the E of the reef may be experienced. Tides rise about 1.5m in the vicinity of Marion Reef.

Mellish Reef

6.9 Mellish Reef (17°2'S., 155°51'E.) encloses a lagoon, with Herald's Beacon Islet (17°25'S., 155°52'E.) 2 miles NNE of its S end. The islet is a grass-covered sandy cay, 1.5m high. Another sand cay, 0.6m high, was reported to lie 2.7 miles NNW of Herald's Beacon Islet.

Mellish Reef, which is narrow and on which there are a few above-water rocks, dries 0.9m. The remains of stranded wrecks lie 2.5 and 3 miles NNW and 1.5 miles SSW of Herald's Beacon Islet. The sea breaks heavily over the E side of the reef, and slightly on other parts.

The lagoon within the reef has irregular depths of 1.8 to 14.6m, with below-water patches, the greater depths being N of Herald's Beacon Islet. The entrance to the lagoon is through a small boat passage, 0.3 mile SSW of the islet.

Anchorage.—Anchorage may be obtained in an emergency by vessels of moderate length, in a depth of 47m, 0.8 mile WSW of Herald's Beacon Islet, but the depths decrease rapidly towards the reef. The anchorage should be approached with the center of the islet bearing 065°, but caution is necessary as the rocks and shoal patches are not easy to see. Discolored water has been seen in the close proximity of the charted position of the anchorage.

Bellona Reefs

6.10 South Bellona Reefs, located with **West Point** (21°52'S., 159°25'E.), the W extremity, about 230 miles ENE of Cato Island, is formed by two reefs, which dry about 1m, and a detached cay. The cay lies on a drying reef which has a boat entrance on its W side; in 1988, this cay was reported to be non-existent. There are some below-water rocks off the SE and NW sides of the reef.

Nigger Head Rock, 0.6m high and prominent, lies on the NE end of the E reef, and is an unusually large, black coral rock. There is a depth of 24m in the fairway between the sand cay and the rock.

The E reef encloses a lagoon with many drying heads in its SW part, but there appears to be no entrance to the lagoon. The W reef, which also encloses a lagoon, is separated from the E reef by a channel, 0.5 mile wide, with a depth of 12.8m in the fairway. Several below-water rocks lie up to 0.5 mile off the N side of the reef, and some off West Point, the W end of the reef. A beacon stands on the reef.

A 24m ridge of foul ground, marked by overfalls, lies 3.5 miles NW of West Point; a depth of 11m lies 7 miles farther NW. A depth of 26m was reported to lie 6.5 miles N of Nigger Head Rock.

Anchorage.—There are regular depths of 37 to 51m, coral sand, off the N side of the reefs, which affords anchorage sheltered from S and SE winds.

Middle Bellona Reefs (21°25'S., 158°25'E.) consists of three reefs, the E of which lies 37 miles WNW of South Bellona Reefs, with navigable openings between. The E reef, which dries 0.9m, encloses a lagoon. The sea always breaks over the reef.

Observatory Cay (21°24'S., 158°51'E.), a bright coral sand cay, 2.1m high, lies near the NW end of the middle reef, which dries 0.9m and encloses a lagoon. There is a boat entrance on the N side of the reef.

Western Breaker, 5 miles W of Observatory Cay, is a group of steep-to below-water rocks, over which the sea breaks, but only at long intervals. Western Breaker is dangerous as it lies so far from the main reefs and in the direction of passing vessels.

Anchorage.—Anchorage may be obtained, in a depth of 20m, coral, sand and rocks, 0.5 mile N of Observatory Cay.

Northwest Bellona Reef (20°52'S., 158°28'E.) is about 5 miles long, 1 mile wide, and dries about 1m. The reef is steep-to on its W side. There are a number of black coral rocks on the reef. A patch, over which the sea breaks, lies 2.5 miles NW of the reef.

Olry Reef (21°26'S., 159°34'E.) lies on the SE side of the Bellona Reef Plateau.

Noel Bank (20°32'S., 158°34'E.) lies at the NW end of the Bellona Reef Plateau.

Booby Reef (21°01'S., 158°34'E.) lies 6 miles S of Northwest Bellona Reef. The reef, which dries 1m and on which the sea always breaks, extends about 7 miles NNW and is about 1 mile wide. The reef has some below-water patches off its SE end, and a below-water rock, 1 mile N of its NW end. There are some black coral rocks on the S side of the reef. The tidal current off the reef sets SW and NE, at a rate of 1.5 to 2 knots.

Anchorage.—Anchorage may be obtained, in a depth of 8m, 0.2 mile off the NW end of the reef. Care must be taken to avoid the below-water rock, 1 mile N of the reef.

Minerva Shoal (20°55'S., 159°22'E.), with a least charted depth of 14.6m, lies 46 miles E of Bellona Shoal. Shallower depths were observed SW of Minerva Shoal. A small drying reef lies about 20 miles WNW of Minerva Shoal. A reef, 1 mile in diameter, which never covers, lies about 10 miles NW of Minerva Shoal. A below-water rock lies 33 miles ENE, and a 9.1m rocky patch lies 40 miles NE, respectively, of Northwest Bellona Reef. Between the last two shoals mentioned above, and the charted 200m curve 32 miles W, there is dangerous ground, which has not been surveyed.

Chesterfield Reefs

6.11 Chesterfield Reefs, with Loop Islet (19°58'S., 158°28'E.) near their S end, consists of three narrow reefs which extend 9 miles N and 27 miles NW, respectively, from South Elbow, their S extremity.

South Elbow (19°59'S., 158°29'E.), on which there is a meteorological station, is well marked by Loop Islet, a flat, tufted islet, 3.4m high, just inside the reef. The inner edge of the reef extending N from South Elbow is bordered by numerous shoal patches, some of which are steep-to.

The **Anchorage Islets** (19°54'S., 158°28'E.) are a group of islets on the inner edge of the reef, 5 miles N of Loop Islet. An isolated underwater dangerous rock lies 1.2 miles NNW of Loop Islet. The third islet from the N, the highest, is 11.6m high. The islets and dry sand cays on the reef add to its elevation, and form a natural breakwater from E. There are numerous wrecks on the islets.

Anchorage.—There is good anchorage in convenient depths inside Chesterfield Reefs in the SE part, sheltered from N through E and S through W. The chief precaution in anchoring is to select a sandy area on which to anchor with swinging room, between the below-water coral patches.

The greater part of this area inside the reefs has regular depths of 37 to 53m, but on the E side numerous steep-to patches have been seen. A below-water reef, dark in color and

difficult to discern, and dangerous even to boats, lies 5 miles W of the highest of the Anchorage Islets. A number of other patches have been reported inside the reef and can best be seen on the chart. The positions of the patches are approximate.

The best anchorage is 0.5 mile W of the highest of the Anchorage Islets.

6.12 Passage Islet (Bennett Islet) (19°55'S., 158°22'E.), 12.5m high, lies 7 miles NW of South Elbow, 0.2 mile SE of the narrow passage from which it takes its name. The passage is 0.2 mile wide, with a depth of 14.6m in the center of the fairway. Several sand cays lie on the reef SE of the islet. A strong 3 knot tidal current sets through it in a S or N direction.

From the above passage, the SW side of the reef extends 4.5 miles NW, and close within the NW end is Long Island. Three small low islets lie on the reef between the passage and Long Island. Shoals, with depths of 2.1 to 2.7m, lie 0.1 mile off the reef on the NE side of Long Island.

Long Island (19°52'S., 158°19'E.), 6.1m high, is the largest of Chesterfield Reefs. A monument stands near the middle of the NE side of the island; a small bush-covered cone stands on its NW end. A boat passage is available through the reef; in good weather boats may pick their way past the dangers lying NE of the monument.

Anchorage.—Anchorage may be obtained, in a depth of 27m, 0.6 mile NE of the monument, or in 24m, 0.7 mile NNE of the monument on Long Island.

Long Island Passage (19°51'S., 158°17'E.), between Long Island and the S end of the W reef, is 2.5 miles wide. The S side of this passage has depths of 11 to 40m; the N side appears to be deeper.

From Long Island Passage, the W side of Chesterfield Reefs extends 14 miles NNW to Northwest Point and is steep-to on its seaward side. The reef encloses a lagoon at its S end, between that point and a sand cay 2 miles N of it. Farther N there are some small sand cays and boulders, mostly awash.

The Avon Isles

6.13 The **Avon Isles** (19°30'S., 158°15'E.), two in number, lie between Northwest Point (19°37'S., 158°13'E.) and the S end of Bampton Reefs, 9 miles N. The islets are 5.2m high and densely covered with stunted trees and grass.

The opening between Northwest Point and the S of the Avon Isles is 4 miles wide, with depths of 7 to 31m. The abrupt rise of this shelf or below-water barrier causes a remarkable tide rip.

The opening between the Avon Isles is 1.2 miles wide, with depths of 16 to 24m; the opening between the N islet and the S end of Bampton Reefs is also 1.2 miles wide, with a depth of 7.3m. The tidal currents in mid-channel between the Avon Isles set SW and NE, and can attain a rate of 2 to 3 knots.

Bampton Reefs

6.14 **Bampton Reefs** (19°18'S., 158°40'E.) form a bank which extends N from Chesterfield Reefs, the E limits of which have only been partially examined. West Bampton Reef, a narrow barrier, extends 35 miles NNE from the Avon Isles to

North Elbow. An underwater rock lies about 3 miles W of North Elbow.

The barrier is low, with groups of boulders, and some rocks, 1.8m high, which when first seen on the horizon have the appearance of sailboats. The rocks are conspicuous at a distance of 6 to 8 miles, although if there is no swell breaking on the barrier, they may not be seen until dangerously close. Small sand cays can also be seen on the S part of the barrier, which also serves to indicate the leeward part of the reefs.

Bampton Island (19°07'S., 158°36'E.), located about 14 miles ESE of North Elbow, is of small extent and about 5.2m high. A fringing reef extends 0.2 mile from its E side and up to 150m from the remaining sides. A sand cay, located 2 miles W of Bampton Island, lies on the E edge of a small reef which has an opening on its W side.

Depths of 31 to 73m are found in the channel between the island and the cay, but to the N they increase rapidly. The area S of Bampton Island, for a distance of about 2 miles, has an average depth of 48m, but has only been partially surveyed.

North Bampton Reef (19°03'S., 158°43'E.) lies with its W extremity 3 miles SW of Bampton Island and extends about 20 miles ENE to NE Cay. It extends E about 8 miles and curves slightly to the N near its center. On the E extremity of this reef is a small sand cay. A passage, 2 miles wide and having general depths of 12.8 to 25.5m, lies E of the cay, between it and the S extremity of another reef.

The last mentioned narrow reef extends about 7.5 miles N and consists of broken patches. It terminates in an elbow at the N extremity of Bampton Reefs; from the elbow the same reef trends 8.5 miles in a S direction. A horseshoe-shaped reef lies 2 miles E of the SE end of the reef.

Northeast Bampton Reef (19°06'S., 159°03'E.) lies with its NW end 1 mile SE of the above horseshoe-shaped reef. The reef extends 2.7 miles SE, and then turns sharply for the same distance SW, forming an elbow. Three small cays lie on the N part of the reef; another small cay lies on the elbow.

Reynard Island (19°14'S., 158°58'E.) is 6.1m high, bush-covered, and fringed by a reef except on its W side. Southeast Bampton Reef lies with its N end 3.5 miles SSE of Reynard Island and extends 10 miles S. There are drying sand cays on the reef.

Skeleton Cay (19°27'S., 158°57'E.) is a coral patch with a sand cay in its center.

Anchorage.—Anchorage may be obtained, in depths of 11 to 18m, 1 mile SW of Bampton Island.

Fair anchorage has been obtained, in a depth of 25m, coral, within the reef, 2.2 miles W of the sand cay on the elbow of Northeast Bampton Reef. Foul ground extends 1.5 miles W from the elbow.

Anchorage may be obtained off the NW or W side of Reynard Island, in depths of 16 to 26m, taking care to avoid a 2.7m rocky patch 1 mile W of the island. This patch is often seen from aloft.

Nereus Reef

6.15 Nereus Reef (20°07'S., 160°28'E.) is reported to have a depth of 3.7m. Its position is doubtful. A shoal, with a depth of 16m, lies 14 miles WNW of Nereus Reef. A depth of 46m was reported to lie mid-way between them.

Two shoals were reported to lie 89 miles ENE and 82 miles NE, respectively, of Nereus Reef.

North Part of Coral Sea—North of Marion Reef

Lihou Reef and Cays

6.16 Lihou Reef and Cays (17°22'S., 151°45'E.) are located with their SW extremity about 90 miles NW of the N extremity of Marion Reef. The reefs and cays extend about 56 miles NE from their SW extremity. Surveys have been made of the SE side and the NE end of the group. A bank, with depths of less than 200m, approximately 12 miles wide, was reported to extend the whole length of the reef on its NW side.

It has been reported that between the SW end of Lihou Reef, and a sand cay, 20 miles NNE, there appeared to be no visual signs of reefs or discolored water. A cay on a reef (17°36'30"S., 151°25'00"E.) was reported to give a response on radar at 11 miles. The NW side of the reef, between the sand cay and Observatory Cay, appeared to be as charted.

From the SW extremity, the barrier consists of a chain of reefs which extend in an ENE direction for about 40 miles to the reef forming the W side of Herald Passage. About eight cays lie on the barrier; there are several openings between the reefs which have not been examined. One of the cays lies about 6 miles WSW of the W side of Herald Passage and is about 2.4m high. A stranded wreck lies on a reef about 4 miles NE of Herald Passage.

Herald Passage (17°24'S., 151°58'E.) is 1.5 miles wide, with a ridge with depths of 7.3 to 9.1m. Inside the ridge there are depths of 37 to 55m. From the entrance to Herald Passage, the reef extends 18 miles NE, and then 9 miles W to Turtle Islet, forming a horseshoe bend. Within the bend the area has not been closely sounded, but there are depths of 27.5 to 55m, and patches with depths of 4.6m.

Observatory Cay (17°08'S., 152°06'E.) is 1.8m high and covered with vegetation. Landing can be made on the W side of the cay. From the cay a chain of reefs, with deep water close inside them, extends 15 miles W and then 5 miles SW, and continue in that direction along the NW side of Lihou Reef. There are several prominent sand cays between Observatory Cay, and Turtle Islet, 4 miles W, none of them more than 1.8m high. A white hut and a tower, 14m high, are conspicuous on Turtle Islet.

Anchorage.—Anchorage was reported within the SW end of Lihou Reef, where there are depths of 14.6 to 51m, and also in the entrance to Herald Passage, in a depth of 8m. Anchorage may be obtained, in a depth of 27.5m, 0.7 mile S of Observatory Cay, with shelter from the swell.

The Diamond Islets

6.17 The Diamond Islets (17°25'S., 151°00'E.), four in number, lie about 20 miles NW of the SW extremity of Lihou Reef and Cays. They have broad sandy beaches and are covered with low trees and bushes. Central Diamond Islet lies in position 17°27'S., 150°56'E.; the other three islets lie 8 miles E, 9 miles W, and 15 miles SSW, respectively, of it. Shoal depths of 9.1 and 10.9m were reported to lie 18 miles WSW and 13 miles W of West Diamond Islet.

East Diamond Islet is 8m high, with a reef extending 1.5 miles N and 1 mile elsewhere around its perimeter. Central Diamond Islet is 7.6m high, and surrounded by a reef similar to the above reef. West Diamond Islet is 6.1m high, with a reef extending 0.7 mile all around. South Diamond Islet is 21.5m high and surrounded by a reef 0.7 mile all around. A shoal was reported to lie about 4 miles W of Central Diamond Islet.

Tregrosse Reefs (17°47'S., 150°37'E.), two small drying reefs, lie 7 and 14 miles SW of South Diamond Islet, close inside the SE edge of a bank. Two below-water rocky patches lie 4 miles WNW and 7 miles W, respectively, of the SW part of Tregrosse Reefs. The area comprising the Diamond Islets and Tregrosse Reefs has only been partially examined.

Abington Reef (18°05'S., 149°37'E.) is nearly awash. The reef is steep-to all around at a distance of 1 mile. Malay Reef, 18 miles WNW of Abington Reef, is difficult to see, not clearly defined, and not steep-to. There is no discoloration of the water and no line of breakers, which is typical of the reefs in the area. The reef should be given a wide berth at all times.

The Coringa Islets

6.18 The Coringa Islets (16°58'S., 150°00'E.) consists of two small reef-fringed islets. **Southwest Islet** (16°57'S., 149°55'E.) lies at the SW extremity of the Coringa Islets in a position about 93 miles NW of the SW extremity of Lihou Reefs. Discolored water and foul ground extend up to 0.5 mile N from the N side of the islet. A depth of 8.2m lies in an approximate position about 1 mile SW of the islet.

Chilcott Islet is located about 4.5 miles ENE of Southwest Islet. It is fringed by reefs and foul ground to a distance of 0.7 mile. Both of the islets lie on drying reefs and are covered with bushes. Depths of as little as 7.3m lie up to 2.5 miles NE and 1.5 miles NNE of Chilcott Islet. A depth of 11.9m lies about 0.8 mile NW of Chilcott Islet; a depth of 6.2m lies 6 miles NE of the islet.

Southwest Islet was reported to lie 1 mile WSW of the charted position. The islet is infested with rats.

Anchorage.—Temporary anchorage may be obtained W of Chilcott Islet and NNW of Southwest Islet, 0.2 mile off the foul ground extending from the islets, but it must be noted that the depths increase very rapidly outside the anchorages.

6.19 Magdelaine Cays (16°36'S., 150°20'E.) consist of an islet and a sand cay. Magdelaine Islet, small and fringed by a reef, lies about 26 miles NE of Chilcott Islet. The islet is 9.1m high and covered with vegetation. The sand cay, located about 6 miles NNW of the islet, is reef fringed, and steep-to on all sides. Landing can be effected on the W side of the cay where there is a break in the reef, however, care must be taken to avoid the numerous coral heads in the approach.

In 1989, Magdelaine Cays were reported to lie 2 miles E of their charted position.

An 11m shoal, which has not yet been completely defined, lies 4 miles W of Chilcott Islet. It was reported that the charted soundings around the islet were incorrect. An unexamined depth of 11m lies 1 mile NW of the islet.

An unexamined depth of 16.7m lies 26 miles SE of Magdelaine Cays; depths of 20m and 25.6m lie 3 miles NE and 4 miles S, respectively, of the 16.7m depth.

A depth of 10m was reported to lie 13 miles NE of Chilcott Islet. A depth of 12m was reported to lie 12 miles WSW of South West Islet.

Herald Cays (16°56'S., 149°13'E.) are two in number. The NE cay lies 4 miles NE of the SW cay. The NE cay is 7m high and the SW cay is 4.6m high; both are covered with vegetation and lie on drying reefs.

Landings can be made on the NW side of both cays, through breaks in the reefs, but care must be taken to avoid the numerous coral heads in the approaches.

A shoal, with a depth of 14.6m, lies between the two cays, but it has not been examined; it is inadvisable to pass through the passage.

The Willis Islets

6.20 The Willis Islets (16°14'S., 150°00'E.) consists of three islets lying on the E and N edges of a bank with general depths of 24 to 49m.

South Islet (16°18'S., 149°59'E.) lies 38 miles N of Chilcott Island. South Islet, 6m high and covered with grass, lies at the N end of a reef, which dries 0.9m, and extends 1 mile S. Buildings, surrounded by palms, and three radio masts stand near the center of the island. A white radar dome atop a 20m lattice tower and a large ground level radar dome are conspicuous. Foul ground extends 0.7 mile W from the reef.

Mid Islet, 5.8m high, 4 miles NNE of South Islet, lies on the W edge of a reef, which dries 0.9m. Foul ground, with deep water between patches, extends 0.7 mile S, 1 mile SW, and 0.7 mile N, respectively, of Mid Islet.

South Passage (16°16'S., 149°59'E.), with depths of 12.8 to 37m, lies between South Islet and Mid Islet. This passage may be safely used with a good lookout aloft, passing midway between the islets. Tidal currents in the passage cause a dangerous overfall.

North Cay (16°09'S., 150°01'E.), a narrow sand cay, with a small cay W of it which dries, lies 5 miles N of Mid Islet. These sand cays lie on the NW part of a reef, which dries 0.9m, and over which the sea always breaks. North Cay Reef is fronted by foul ground extending up to 1.5 miles from the inner side of the S end of the reef.

The opening between Mid Islet and North Cay Reef is divided into two channels by a dangerous patch, on which there are several shallow shoals, some of which are awash and break.

North Passage (16°13'S., 150°01'E.), between the dangerous patch and Mid Islet, is 1.2 miles wide, with depths of 14.6m. Within the entrance, the depths increase and are irregular.

The channel between the dangerous patch and the foul ground, which extends S from North Cay Reef, is 0.6 mile wide. Apart from the single line of soundings on the chart across the entrance, it has not been surveyed.

Anchorage.—Anchorage may be obtained, in a depth of 49m, sand, 1 mile W of South Islet, and also in a depth of 46m, coral, 0.7 mile WNW of Mid Islet. Before anchoring leeward of the Willis Islets, a sufficient space of clear ground, which will best be seen from aloft, should be found. This should allow for swinging room and for getting underway, without fouling the coral rocks, which rise abruptly to near the surface.

Caution.—The Willis Islets have been reported (1991) to lie 2 miles W of their charted position.

Diane Bank and Moore Reefs

6.21 Diane Bank (15°46'S., 149°43'E.), with a depth of 16.5m, lies near the N end of a bank with general depths of 22 to 51m, which extends 33 miles S. Depths of 14.6 to 18.3m lie close inside the S end of the bank. A sand cay, 3m high, lies close inside the NW end of the bank. Depths of less than 18.3m are reported to extend at least 3.5 miles NE from the sand cay.

Unexamined depths of 4m and 15m lie 1 mile SW and 2 miles ENE of the sand cay.

Moore Reefs (16°00'S., 149°09'E.), three coral reefs awash, lie 32 miles WSW of Diane Bank. There are two sand cays on the N reef; one is 2.4m high while the other dries 0.9m. Both reefs are steep-to.

A reef lies 24 miles WSW of Diane Bank; a 3m shoal was reported to lie 3 miles WNW of this reef. Numerous sharks have been sighted in this vicinity.

A depth of 22m lies 15 miles SSW of South Islet.

Flinders Reefs

6.22 Flinders Reefs (17°35'S., 148°24"E.) consists of two main groups and several adjacent reefs and shoal patches. The S reef (17°55'S., 148°30'E.) of the S group lies with its S extremity about 220 miles WNW of the N extremity of Marion Reef. These reefs have only been partially surveyed.

It has been reported that the positions of Dart Reef, North Reef, and Herald's Surprise lie 1 to 2 miles further N than charted.

South Flinders, the smaller S complex, is 8.5 miles long and 4 miles wide, lying SE-NW. The SE end of this S group is a semi-circular reef, 4 miles wide, opening to the NW, which dries in places with deeper water between. Rocks, both submerged and drying, extend 0.5 mile from the inner edge of this reef.

Channel Reef, which dries, is the N part of South Flinders group. In the center of the reef is a drying sand cay.

Entrance Reef (17°49'S., 148°25'E.), which dries, and lies 2 miles S of Channel Reef and 1 mile SSE of the W reef, is the SW limit of the group. A patch of shoal water lies midway between Channel Reef and the W reef; it is reported that deep water lying either side of this patch is the preferred entrance into the lagoon contained within the group of reefs.

North Flinders Reef is a large group of reefs and shoal water, 21 miles N-S and 17 miles E-W, which enclose a lagoon. At the SE corner of the group is **East Ribbon Reef** (17°40'S., 148°35'E.), which is narrow, curving, and 11 miles long. A sand cay was reported (1978) to lie on the N part of this reef.

Toe Reef (17°42'S., 148°31'E.) lies 0.8 mile W of the SW point of East Ribbon Reef, with foul ground between. Main Cay Reef lies 2 miles W of Toe Reef. Cod Reef, awash, lies 2.5 miles W of Main Cay Reef.

Victoria Cay (17°44'S., 148°27'E.) is a 2m high sand cay that lies on Main Cay Reef. An automated weather station, consisting of instruments, aerials, and a 15m high radio mast, stands on the NW side of the cay.

South West Reef (17°43'S., 148°21'E.) lies awash and clearly visible, is the SW extremity of the N group of Flinders Reef and it is separated from Cod Reef by a 1 mile wide passage that is fouled by a number of coral heads. A boulder, 1m high, lies

on the W edge of this reef. Breakers on this reef were seen at 3 miles (1990).

Mid Reef (17°35'S., 148°20'E.), awash, lies 7 miles N of South West Reef. Unexamined shoals lie 2.7, 4, 5.3, and 6.5 miles N of the boulder on South West Reef.

6.23 North West Reef (17°31'S., 148°18'E.), awash, is the W edge of the N group of Flinders Reef. An unexamined shoal lies 1.2 miles SE of North West Reef on the edge of the bank. There are apparently several obstructions lying between this shoal and Mid Reef, 2.5 miles SSE.

Anchorage may be obtained 1 mile SW of the N end of East Ribbon Reef, in depths of 42 to 48m; a good lookout is essential. A reef, which dries 0.5m, and a coral head, 0.1m, lie 1 mile SSE and 0.9 mile S, respectively, from this anchorage.

Another anchorage lies 5 miles SSW of the above anchorage. A single line of soundings leads to this anchorage, and a good lookout from aloft must be kept as this course leads close E of a drying patch midway between the two anchorages. Another drying patch lies 1.2 miles ENE of the S anchorage, and two more patches lie 3 miles WSW of it. A shoal, with a depth of 6.1m, was reported in position 17°24'S, 148°54'E.

North Reef (17°27'S., 148°20'E.), which dries 0.9m, lies close inside the NW edge of the main bank.

Anchorage.—Anchorage may be obtained 0.5 mile W of North Reef, in a depth of 46m.

6.24 The N danger of the group of Flinders Reefs is a bank (17°24'S., 148°25'E.), with depths of less than 15m. The passage between North Reef and this bank is clear. From seaward, depths rise steeply from 400m to less than 60m and deepen very slightly.

The edge of the main bank between the N danger and the N point of East Ribbon Reef, 10.5 miles SSE, has not been delineated but appears to be clear. Depths of less than 30m are indicated 5.5 miles NNW from the N point of East Ribbon Reef.

Dart Reef (17°24'S., 148°11'E.), a circular reef, about 2 miles in diameter, lies about 7.5 miles WNW of North Reef. The reef, which is steep-to, encloses a lagoon in which there are many rocky heads. There is an opening to the lagoon on the NW side of the reef. The reef is entirely covered at HW and in calm weather is not always visible.

McDermott Bank, with a least known depth of 22m, lies about 20 miles WNW of Dart Reef.

Herald's Surprise (17°20'S., 148°26'E.) lies 8 miles NE of North Reef and is circular in shape, with a diameter of about 2 miles. The reef, over which the sea breaks, dries in places, and is steep-to. Some above-water rocks lie near the NW edge of the reef.

In 1981, a shoal area 3 miles long and 1 mile wide, lying in a NE-SW direction, was reported to exist in position 17°24'18"S, 148°53'48"E, about 25 miles E of Herald's Surprise. The least known depth over the shoal is 4.9m.

Flora Reef and Holmes Reef

6.25 Flora Reef (16°45'S., 147°45'E.), lying about 50 miles NW of Herald's Surprise, was reported to have breakers on its S side where the reef is about 4.5 miles long. The SE

extremity of the reef may dry at LW. Discolored water extends from the SW end of the reef.

Holmes Reef (16°28'S., 147°58'E.) lies with the S extremity of the W group of reefs, 13 miles NNE of Flora Reef, and consists of two groups, separated by a 3.5 mile wide passage which appears to be free of dangers. It is very deep N and S of the reefs. The E group of reefs is awash and encloses a shallow lagoon, which is entered on its W side.

The W group of Holmes Reefs consists of three reefs, which dry in places. Only the S and N ends of the E reef, and the N side of the N reef, have been surveyed. A conspicuous tower stands on the sand cay near the center of the W group. An underwater rock lies 7.7 miles NE of the conspicuous tower on the W group.

Landings can be made on the W side of the two charted cays, taking care to avoid the coral heads in the near approach.

There is apparently a deep, but narrow passage between the S and E reefs, but that between the E and N reefs is foul. Two patches of discolored water were reported to lie 1 mile within the W end of the N reef.

When approaching the W group of Holmes Reefs from SW, care must be taken not to mistake the S sand cay for the 1.8m high cay 2.5 miles NE of it.

A depth of 41m lies 40 miles W of the W group.

Bougainville Reef

6.26 Bougainville Reef (15°30'S., 147°07'E.) is located about 69 miles NNW of the N extremity of Holmes Reefs. It is about 2.5 miles in length and 1.5 miles wide. The reef dries at half tide and, when covered, is difficult to see in calm weather.

Two stranded wrecks lie on this reef. It was reported that both wrecks give good radar returns up to 14 miles. A light stands on Bougainville Reef.

Osprey Reef

6.27 Osprey Reef (13°55'S., 146°36'E.) lies 97 miles NNW of Bougainville Reef. The reef extends in a general NNW direction for a distance of about 16 miles and encloses a lagoon from 1.5 to 4.5 miles wide. North Horn, the N extremity of the reef, is steep-to with great depths 0.5 mile N of it. **Rapid Horn** (14°01'S., 146°42'E.) forms the S extremity of the reef. The reef in most places is awash; during strong SE winds, the sea breaks heavily on the SE side and moderately on the NE side, but does not break on the W side.

The entrance to the lagoon is 0.5 mile wide, with depths of 9.1 to 18.3m. There are several detached reefs within 1 mile S of the entrance. The entrance to the reef is reported (1989) to be clearly defined from seaward. Depths immediately within the entrance are generally 19 to 35m, although there are least depths of 10m. The S side of the entrance is shoal and encumbered with coral. From just within the N side of the entrance, a line of detached coral heads extends ESE for a distance of 0.7 mile; the deepest water is reportedly 50m S of this line.

There is anchorage in the middle of the entrance, in a depth of 11m, but the depths increase very rapidly outside.

Shark Reef (14°17'S., 146°56'E.), with a least depth of 7.8m, coral, and steep-to, lies 9 miles SE of Rapid Horn. A bank, with a depth of 14.5m, lies 13 miles SE of Shark Reef, while a 10m shoal lies 4 miles SSE of Shark Reef.